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# **Why landscape terms matter for mapping: A comparison of ethnogeographic categories and scientific classification**

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## **1. Introduction**

Categories are central in the way we structure information about the world around us and form the basis for representations in GIS. However, the translation of natural language concepts and categories into formal GIS environments is complicated by the fact that different terms can be used for the same phenomenon or the same terms can be understood in different ways (Harvey et al. 1999, Bishr 1998). Semantic interoperability remains a challenge even where it applies to seemingly straightforward terms such as ‘forest’, as conceptualizations of the phenomenon vary between different communities of practice, resulting in different classifications (Comber et al. 2005) with implications for management of these areas (Robbins 2001).

Ontologies as specifications of certain conceptualizations are important for developing formalized representations in GIS (Schoorman 2006). However, in building an information system, the question is ‘where to take the ontology from’. One approach is to use scientific classifications, which has been criticized for imposing conceptualizations that fail to take into account how local people perceive, refer to and interact with landscape (Rundstrom 1995). Given the importance of GIS in spatial planning and natural resource management, there is a need to consider how to better elicit and represent such local concepts and categories and how multiple competing ontologies can be represented (Turnbull 2007).

In this respect, folk categories can provide the basis for ontology development (Wellen and Sieber 2013, Kuhn 2001, Smith and Mark 2001). The field of ethnophysiology, positioned between GIScience, social anthropology and linguistics deals with folk categorizations of the geographic domain, focusing on how different speech communities refer to and categorize landscape features including landforms and vegetation assemblages, as well as the cultural beliefs and customs related to those features (Mark et al. 2011, Mark and Turk 2003). Here, we present initial findings on the comparison of ethnogeographic categories with a scientific classification in the Bolivian Amazon.

## **2. Methods**

As is common in ethnophysiology, we adopted a set of ethnographic methods including field walks and semi-structured interviews on landscape pictures to elicit terms for geographic features. We conducted our study in the Madidi National Park, established in 1995 to protect the region’s high biological and cultural diversity. In the study area along the Beni river, people self-identify as Takana, an indigenous group with about 5,000 people, of whom the majority are now Spanish monolingual speakers. Contemporary Takanan lifestyles are based on a mixture of hunting, fishing, subsistence agriculture and wage-labour.

We collected data for this study over a period of 7 months from 2012 to 2013, with a total of 14 interviews held in Spanish.

### 3. Results

We documented 158 generic Spanish terms for geographic features. The most terms are coined for vegetation units, followed by those related to agriculture, water and topography. In the following, we focus on vegetation as an integral part of the landscape (and not simply land cover or land use) covering most of the land surface in our study area.

Out of 59 identified vegetation related landscape units, most are named after plants that have specific local uses. One example is the term *balsal* for an area that consists of *balsa* trees (*Ochroma pyramidale*). The Takana use a *balsal* as an area where they harvest *balsa* trees for building rafts and cut off bark to use as ropes. This example illustrates how most of the local landscape terms are monolexical and linguistically transparent. By adding the Spanish suffix ‘-al’ to a plant name, it becomes a generic landscape term.

The 59 local terms for vegetation units differs from an existing botanical classification with 15 broad vegetation units (Fuentes 2005). More importantly, we also observed differences at a more conceptual level. Certain terms such as *monte alto* (‘forest’, Table 1) are spiritually significant, as they are believed to be inhabited by forest spirits, where certain rules need to be followed when entering or extracting resource in such areas.

Table 1. Examples from local terms and a scientific botanical classification

Local term	Scientific classification
<i>balsal</i>	Riverine vegetation characterized by <i>Ochroma pyramidale</i>
<i>barbecho</i>	Lowland Amazonian forest
<i>charral</i>	Pioneer riverine scrub vegetation on sandy soils characterized by <i>Gynerium sagittatum</i>
<i>japainal</i>	Seasonally flooded Amazonian forest characterized by <i>Heliconia episcopalis</i>
<i>monte alto</i>	Lowland Amazonian forest

An apparent mismatch between the local and the scientific conceptualization is illustrated through the landscape term *barbecho* (Table 1). For the Takana, a *barbecho* is an old agricultural field left fallow that can be re-planted again. However, due the dense herbal layer and tall trees used as border markers by the Takana, the National Park administration classified these forest patches as ‘primary rainforest’, leading to exclusion of local people.

### 4. Discussion and Conclusion

We have shown that the ethnogeographical categories of the Takana in Bolivia consist of at least 158 terms, with most terms being coined for vegetation units. As these terms are commonly used in direct speech and are linguistically simple, they can be seen as ‘basic terms’ (Tversky and Hemenway 1984). These ‘folk generic terms’ are more diversified than the scientific classification and provide valuable information for developing more appropriate classification systems in which the spatial categories to be represented in a GIS can be locally grounded (Wellen and Sieber 2013, Mark et al. 2011). However, this local grounding then also needs to be translated into more culturally appropriate GIS, which takes into account the varied local understandings of landscape. Such understandings are intimately connected to the environment and specific livelihoods of a speech-community. In the arid lands of Australia, the Yindjibarndi for instance have a diversified vocabulary for hydrological features that contain the magnitude of water flow (Turk et al. 2011), while the Gitskan in

Canada distinguish different snowfields, avalanche tracks and cliffs that reflect their need for a vocabulary describing travel routes and hunting areas in mountainous terrain (Johnson 2011).

Such folk classifications and differences with formal scientific classifications are not merely local curiosities, but have consequences for how these areas are classified and ultimately managed. Given the importance of GIS in landscape planning and management, the need remains to consider how to more adequately represent multiple ontologies (Turnbull 2007).

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